09/973,778
Art Unit: 1731
Submission under 37 CFR 114(a)

Remarks

Parts of the office action are not understood. For example, on page 5, the Examiner refers to claim 28, whereas there is currently no claim 28 in the application, as noted on the front page of the office action. Similarly, with regard to the objection to claim 21, the Examiner refers to the language "varied among choices", yet claim 21 contains no such language. It was removed in response to the previous office action and replaced by the more conventional Markush language in claim 21 presently on file.

The objection with respect to the added language Fourier Transform Infrared Spectroscopy is respectfully traversed. **FTIR** is an extremely well known acronym to those skilled in the art. It is so well known that it was believed not to require explanation, especially in view of the Figures, which are clearly FTIR spectra. A simple search for FTIR on the USTPO website revealed 5229 hits. A sample was checked to confirm they relate to Fourier Transform Infrared (not all were checked for practical reasons). A reference to FTIR can be found in the Handbook of Semiconductor Manufacturing Technology, Marcel Decker, Inc., New York ISBN 0-8247-8783-8, published 2000. A copy of page 911 of this publication is attached. The applicants find it difficult to understand why the Examiner does not accept this acronym as a well known term of art. It is so well known that it is respectfully submitted that the Examiner ought to be able to take official notice of its meaning. It is like asking the applicants to provide evidence that °C means degrees Celsius. Or is the Examiner's concern the fact that the word *spectroscopy* has been added. If that is the case, of course, technically the Examiner is correct. FTIR strictly speaking just stands for Fourier Transform Infrared, and claim 20 has been so amended. To provide formal support, but not new matter (since the term is self-explanatory), the acronym has been spelt in full in paragraph 0003.

"in resistant" and cores were typographical error that has been corrected. While the typographical errors are regrettable, it is believed self evident as to what was the intended meaning. Claims 6, 7, 10, 11, 12, 13, and 18 and 19 have been clarified. The structure of course passes through multiple temperatures between the initial and final temperatures. The problem is that it is hard to define a changing temperature in a way that provides a proper antecedent. The language of the dependent claims has been amended to make it clear that they relate to

limitations on the generic steps defined in claim 1. It is believed that the amended wording solves the problem.

The last part of claim 1 has been clarified. In step f(iii) the temperature is ramped down while the structure undergoes elastic deformation. During this elastic deformation the tensile stress decreases to a final value that is less than the initial value. Paragraph 185 has been corrected. It is clear from Figure 10 that the stress of the core initially increases with temperature and similarly at the final ramp down decreases with temperature.

With regard to claim 21, the dependency was incorrect. Claim 21 should be dependent on claim 20, which provides an antecedent for the various terms specified.

With regard to claim 20, the Examiner has taken a very restrictive view of the term dimension. It is possible to define a multi-dimensional vector space having a large number of components.

With regard to the objection under 35 USC 103(a), the Examiner notes that "it is unclear how they (the arguments relating to stress level) relate to any claimed limitations" and that features of the specification are not incorporated into the claims. The specification as a whole explains how if the steps explicitly set forth in claim 1 are carried out, the changes in stress level shown in Figure 10 will take place and as a result a high quality component with good absorption characteristics will be obtained. This result follows from the novel sequence of steps set forth in claim 1 associated with the functional limitations on the changes in stress. If the applicants recite novel steps in a claim, it is permissible to refer the Examiner to the specification to note the advantages that flow from those steps.

Ohja '188 teaches a method of annealing a planar waveguide layer to remove small imperfections in the structure. Ohja '188 teaches a process wherein the structure is heated in two steps, namely a first step in which the structure is heated to a temperature below the flow temperature of the cladding layer to drive off volatile materials and a subsequent step in which the structure is heated to a temperature close to or above the temperature of the cladding layer. The object of the invention described in Ohja '188 is to reduce the long annealing times.

Ohja '188 teaches nothing about the specific substeps (i-iii) of each thermal treatment and in particular the control of the stress as specifically set forth in claim 1. Moreover, Ohja '188

teaches two sequential anneals without an intervening deposition. Ohja '188 does not teach the intervening step of depositing the silica core layer.

In addition, it is respectfully submitted that it would not be obvious from the teaches of Ohja '188 to ramp down the temperature between the two anneal steps because this action would inevitably prolong the time of the overall anneal, which is directly contrary to the teachings of Ohja '188 that a short anneal time is required. It cannot be obvious to take an action that is inconsistent with the teachings of a reference.

Grant merely teaches a waveguide structure with the cladding layer deposited as a series of successively annealed layers in order to minimize the incidence of voids. Each layer is deposited and followed by an annealing step. In the example given at the top of column 3, the structure is heated to the same temperature in each step. Grant does not teach the particular sequence of steps set forth in claim 1 wherein the structures as subjected to specific treatments to relieve compressive or tensile stress as more particularly set forth in claim 1. The Examiner appears to have given no patentable weight to the stress changes in the structure, but these are an important part of the invention, which is based in part on the teachings of Figure 10. For example, the ramping rates having a bearing on the stress changes, and must be adjusted so that the stated effects occur. Grant does not teach ramping and is silent as to any ramp rates.

Furthermore, it is respectfully submitted that the Examiner has not given proper weight to the terms core and buffer layer as used in the claims. Terms must be given there ordinary meaning as understood by one skilled in the art. The terms core and buffer have well defined meanings as understood in the art. Grant uses the term core layer in correct sense and in the same sense as the term is used in the present application. Grant forms the cladding layer, which is different from the core layer, by depositing multiple sublayers and performing an anneal after each deposition. Grant makes this clear in the abstract where he refers to a layer of "cladding material" ..."deposited" ..."as a succession of individually annealed layers". One of these sublayers cannot be mistaken for a core layer as the term is understood in the art. There is a clear manipulative difference because Grant is building up one functional layer by forming as succession of anneals, whereas the invention relates to the formation of different functional

layers having different properties. The core and buffer layers inherently have different properties, such as refractive index.

Since Grant does not disclose the detailed stress relief steps set forth in claim 1, which form part of the invention and result in a high quality optical product, in the applicant's respectful submission a combination of Grant and Ohja '188 does not result in the invention claimed. Moreover, in the absence of any indication in Grant that wafer bow is a problem, there would be no motivation to include the compensating layer of Ohja '188.

Reconsideration and allowance are therefore respectfully requested.

Respectfully submitted,

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